

CLAIM LISTING

No claims have been amended, canceled, or added. A Claim Listing is provided as a courtesy.

1. (Previously Amended) An apparatus, comprising:
 - a first wafer having layer of bulk silicon, a first layer of active silicon disposed on the first layer of bulk silicon, a first layer of interconnects disposed on the first layer of active silicon, and a first metal pattern disposed on a top surface of the first layer of interconnects;
 - a second wafer having a second layer of bulk silicon, a second layer of active silicon disposed on the second layer of bulk silicon, a second layer of interconnects disposed on the second layer of active silicon, and a second metal pattern disposed on a top surface of the second layer of interconnects, wherein the first wafer turned upside down; and
 - an interposer disposed between the top surface of the first metal pattern and the top surface of the second metal pattern, the interposer having a pattern of metal vias disposed in a cured thermosetting plastic, the pattern of metal vias being aligned with and electrically coupled to the first metal pattern and the second metal pattern, wherein the first wafer is bonded to the second wafer face-to-face using the interposer.
2. (Original) The apparatus of claim 1, wherein the interposer further comprises a dielectric film disposed in the cured thermosetting plastic.
3. (Original) The apparatus of claim 1, wherein the cured thermosetting plastic comprises a polyimide material.
4. (Original) The apparatus of claim 3, wherein the cured thermosetting plastic comprises an epoxy material.
5. (Withdrawn) A method, comprising:
 - removing a bottom release layer from an interposer, the interposer having a pattern of metal vias disposed in a thermosetting plastic film;

aligning the pattern of metal vias with a first wafer metalized pattern disposed on a first wafer;
laminating the thermosetting plastic film to the first wafer;
removing a top release layer from the interposer;
aligning the pattern of metal vias with a second wafer metalized pattern disposed on a second wafer;
curing the thermosetting plastic film; and
electrically bonding the first wafer metalized pattern to the second wafer metalized pattern through the pattern of metal vias.

6. (Withdrawn) The method of claim 5, wherein electrically bonding the first wafer metalized pattern to the second wafer metalized pattern through the pattern of metal vias comprises solder bonding the first wafer metalized pattern to the second wafer metalized pattern through the pattern of metal vias.

7. (Withdrawn) The method of claim 5, wherein electrically bonding the first wafer metalized pattern to the second wafer metalized pattern through the pattern of metal vias comprises diffusion bonding the first wafer metalized pattern to the second wafer metalized pattern through the pattern of metal vias.

8. (Withdrawn) A method, comprising:
aligning a pattern of metal vias disposed in a dielectric film with a first wafer metalized pattern on a first wafer;
aligning the pattern of metal vias with a second wafer metalized pattern on a second wafer;
heating the first wafer to electrically bond the first wafer metalized pattern to the second wafer metalized pattern through the pattern of metal vias;
disposing a thermosetting plastic in fluid form in a gap between the first wafer and the second wafer; and
curing the thermosetting plastic.

9. (Withdrawn) The method of claim 8, wherein heating the first wafer to electrically bond the first wafer metalized pattern to the second wafer metalized pattern through the pattern of metal vias comprises at least one of forming a first solder bond between the first wafer metalized pattern and the pattern of metal vias or forming a second solder bond between the second wafer metalized pattern and the pattern of metal vias.

10. (Withdrawn) The method of claim 8, wherein heating the first wafer to electrically bond the first wafer metalized pattern to the second wafer metalized pattern through the pattern of metal vias comprises at least one of forming a first diffusion bond between the first wafer metalized pattern and the pattern of metal vias or forming a second diffusion bond between the second wafer metalized pattern and the pattern of metal vias.

11. (Withdrawn) The method of claim 8, further comprising disposing a polyimide in the gap between the first wafer and the second wafer.

12. (Withdrawn) The method of claim 8, further comprising disposing an epoxy in the gap between the first wafer and the second wafer.

13. (Withdrawn) The method of claim 8, further comprising using capillary action to dispose the thermosetting plastic in the gap between the first wafer and the second wafer.

14. (Withdrawn) The method of claim 13, further comprising using a vacuum to dispose the thermosetting plastic in the gap between the first wafer and the second wafer.

15. (Withdrawn) The method of claim 13, further comprising applying a positive pressure to the thermosetting plastic to dispose the thermosetting plastic in the gap between the first wafer and the second wafer.

16. (Withdrawn) A system, comprising:
a transceiver to transmit a wireless signal; and
a die stack comprising:

a central processing unit (CPU) die having a CPU metal pattern on a top surface;
a memory having an memory metal pattern on a top surface; and
an interposer disposed between the top surface of the CPU die and the top surface of the memory die, the interposer having a pattern of metal vias disposed in a cured thermosetting plastic, the pattern of metal vias being aligned with and electrically coupled to the CPU metal pattern and the memory metal pattern,
at least one of the CPU metal pattern or the memory metal pattern being coupled to the transceiver.

17. (Withdrawn) The system of claim 16, wherein the transceiver is a Global System for Mobile Communication (GSM) transceiver.

18. (Withdrawn) The system of claim 16, wherein the transceiver is a personal communication system (PCS) transceiver.

19. (Withdrawn) An article of manufacture, comprising:

a machine-accessible medium including data that, when accessed by a machine, cause the machine to perform the operations comprising:

removing a bottom release layer from an interposer, the interposer having a pattern of metal vias disposed in a thermosetting plastic film;

aligning the a pattern of metal vias with a first wafer metalized pattern on a first wafer and laminating the thermosetting plastic film to the first wafer;

removing a top release layer from interposer and aligning the pattern of metal vias with a second wafer metalized pattern on a second wafer;

curing the thermosetting plastic film to bond the first wafer to the second wafer and heating pattern of metal vias to electrically connect the first wafer metalized pattern to the second wafer metalized pattern.

20. (Withdrawn) The article of manufacture of claim 19, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising solder

bonding the metalized interconnect to the first wafer metalized pattern and the second wafer metalized pattern.

21. (Withdrawn) The article of manufacture of claim 19, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising diffusion bonding the metalized interconnect to the first wafer metalized pattern and the second wafer metalized pattern.

22. (Withdrawn) An article of manufacture, comprising:

a machine-accessible medium including data that, when accessed by a machine, cause the machine to perform the operations comprising:

aligning a pattern of metal vias of a metalized interconnect disposed in a dielectric material with a first wafer metalized pattern on a first wafer;

aligning the pattern of metal vias with a second wafer metalized pattern on a second wafer;

bonding the pattern of metal vias to the first wafer metalized pattern and the second wafer metalized pattern;

disposing a thermosetting plastic in liquid form between the first wafer and the second wafer; and

curing the thermosetting plastic.

23. (Withdrawn) The article of manufacture of claim 22, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising diffusion bonding the metalized interconnect to the first wafer metalized pattern and the second wafer metalized pattern.

24. (Withdrawn) The article of manufacture of claim 22, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising solder bonding the metalized interconnect to the first wafer metalized pattern and the second wafer metalized pattern.

25. (Withdrawn) The article of manufacture of claim 22, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising disposing a polyimide between the first wafer and the second wafer.

26. (Withdrawn) The article of manufacture of claim 22, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising disposing an epoxy between the first wafer and the second wafer.

27. (Withdrawn) The article of manufacture of claim 22, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising using capillary action to dispose the thermosetting plastic between the first wafer and the second wafer.

28. (Withdrawn) The article of manufacture of claim 27, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising using a vacuum to dispose the thermosetting plastic between the first wafer and the second wafer.

29. (Withdrawn) The article of manufacture of claim 27, wherein the machine-accessible medium further includes data that cause the machine to perform operations comprising applying a positive pressure to the thermosetting plastic to dispose the thermosetting plastic between the first wafer and the second wafer.

30. (Previously Presented) The apparatus of claim 1, wherein the first wafer includes a first device disposed in at least a portion of the first metal pattern.

31. (Previously Presented) The apparatus of claim 30, wherein the second wafer includes a second device disposed in at least a portion of the second metal pattern.